

## THE TAXONOMY OF SETCREASESEA OVATA

SHAMIM A. FARUQI, R. P. CELARIER<sup>1</sup> AND K. L. MEHRA

*Setcreasea ovata* is a variable taxon which has frequently been confused with *S. brevifolia* (Torr.) Sch. et Sydow. Johnston (1944) in an attempt to clarify the differences between *S. brevifolia* and *S. buckleyi* Jtn. mentioned specimens from the Chisos and Davis Mts. of Texas as *S. brevifolia*, but actually referred them to *S. ovata*. On the other hand, Rose (1899) included *S. ovata* as a synonym of *S. brevifolia*. This confusion is primarily due to the similarity of leaf shape of these two species. Also, morphological studies have shown that *S. ovata* is very similar to *S. pallida* Rose in its floral characters.

*S. pallida* differs from *S. brevifolia* in possessing oblong-elliptic leaves, broad membranous connectives and glabrous ovaries, whereas *S. brevifolia* possesses elliptic-ovate leaves, narrow and thick connectives and pubescent ovaries. For a clear-cut differentiation of the two species, the following descriptive material should be helpful.

*S. pallida*: stem more or less 40 cm. tall; leaves oblong-elliptic; sepals 3; petals 3; stamens 6, epipetalous, connectives broad and membranous; ovary glabrous.

*S. brevifolia*: stem more or less 40 cm. tall; leaves ovate-elliptic; sepals 3; petals 3; stamens 6, epipetalous, connectives narrow and thick; ovary pubescent.

*S. ovata* was originally described by Coulter (1890) as *Tradescantia leiandra* var. *ovata*. *S. brevifolia* was also described as a variety of *T. leiandra* by Torrey (1859). Rose (1899) gave generic rank to this group of plants, characterized by having connate corollas and epipetalous stamens, under a new genus *Treleasea*. *Treleasea* being the name of an already described fungus, Schumann and Sydow (1899), changed it to *Setcreasea*. The rank of various species described by Rose in the treatment of Schumann and Sydow remained the same, and, as mentioned before, Rose had included var. *ovata* as a synonym under *S. brevifolia*.

The original description of Torrey (1859) for var. *brevi-*

<sup>1</sup>Deceased December 23, 1959.

*folia* indicates a pubescent ovary. The colored plate included by Rose in his publication shows the same. These facts and others lead us to believe that both Rose and Johnston did not study the internal structures of *S. ovata* and presumed it to be *S. brevifolia* because of the close resemblance of the leaves in each case.

All of the taxa of *Setcreasea* that were studied experimentally in our laboratory show a vegetative mode of reproduction and a high degree of self-incompatibility. However, inter-specific hybridization is common. Even triploid hybrids are quite vigorous and are vegetatively normal. Therefore, the designation of specific rank to a new taxon should be made only with caution. However, the species *S. ovata* was found to be an exception to the generic tendency toward easy interspecific hybridization. We could not produce any hybrids involving either *S. brevifolia* or *S. pallida*. A single hybrid was produced by using *S. purpurea* as a female parent. The details of the crossing data are given in Table 1.

*S. jaumavensis* Matuda according to the type description is another species that comes very close to *S. ovata*.

TABLE I

Attempted Cross	Pollinations	Swollen ovary	Seed Set	Seedlings	Plant
<i>S. ovata</i> × <i>S. pallida</i>	17	1	2	none	none
<i>S. ovata</i> × <i>S. purpurea</i>	11	9	32	none	none
<i>S. pallida</i> × <i>S. ovata</i>	65	48	6	none	none
<i>S. purpurea</i> × <i>S. ovata</i>	22	11	29	1	1
<i>S. brevifolia</i> × <i>S. ovata</i>	12	6	11	none	none
$2n=23$					

These species are similar in their floral structures. The type specimen of *S. jaumavensis* is a fragment of Rozhynsky's collection number 260, dated December 14, 1931, and is supposed to be in the herbarium of the New York Botanical Garden. This specimen has been misplaced, consequently it is at present unavailable. We came across another fragment of Rozhynsky's collection 260 from the herbarium of the Chicago Natural History Museum determined as *Tradescantia semisomna*. A very careful study of floral

parts showed a fused corolla and epipetalous stamens, the criteria used to separate the genus *Setcreasea* from *Tradescantia*. This plant is found to be similar to *S. ovata* both in floral and vegetative structures, consequently a doubt arose regarding the validity of *S. ovata* as a separate species. On the basis of the type description, the leaves of *S. jaumavensis* are broadly lanceolate and pubescent. In Rozhynsky 260 from the Chicago Natural History Museum the leaves are ovate and glabrous. The difference in leaf shape should not be too seriously considered due to the fact that in this specimen there are only two upper leaves present which may not represent a normal mature leaf. But the absence of leaf pubescence provides a very good reason to believe that Rozhynsky 260 from the Chicago Natural History Museum is not *S. jaumavensis*, rather it appears to be part of a mixed collection. Dr. Matuda (personal communication) is in agreement with the authors' opinion that *S. ovata* is distinctly different from *S. jaumavensis*, specially in leaf pubescence.

These studies point out that *S. ovata* is a distinct taxon which is not easily confused with any of the three species, i.e. *S. pallida*, *S. brevifolia* or *S. jaumavensis*. It certainly deserves specific rank.

***S. ovata* (Coulter) Faruqi, Celarier and Mehra, stat. nov.**

Based on *Tradescantia leiandra* var. *ovata* Coulter, Contr. U. S. Nat. Herb. 1: 50, 1890.

Plant perennial with underground rhizome; aerial stem usually erect, great variation in the height of the plant, 20-30 cm. or more; leaves elliptic or ovate; inflorescence terminal subtended by two leafy bracts; pedicel pubescent; calyx 3; corolla 3, pink; stamens 6, epipetalous, connectives broad membranous; ovary glabrous.

TYPE: Texas. Neally 1889 (US).

TEXAS: Chisos Mts. Brewster Co. *Hinckley* 7-31-1940 (GH); *Hinckley* 1113 (F); *Havard* 78 (GH, US); *Warnock* T 574 C (GH, US, F); *Warnock* 643 (US); *Sperry* 1476 (GH, US); *Moore & Steyermark* 3228 (GH, MO, F); *Mueller* 7854 (F, US, MO, MICH); *Young* 122 (MO); *McDougall* 33 (GH); Birdmine Hill, East of Alpine, *Warnock* 21589 (MO, F); Railroad at Rio Grande, *Eggert* 1737023 (MO); Devils River, *Clark* 4138 (MO).

MEXICO: Coahuila: North of Cañon de Cienegas, *White* 1899 (MICH); Villa Acuña, *Wynd and Mueller* 624 (GH, MO); Muzquiz, *Wynd and Mueller* 335, (GH, US); Soledad, SW of Monclova, *Palmer* 2014 (GH);

Sierra de la Encantada, Rancho Buena Vista, *Stewart 1438* (GH); Sierra del Pino, Head of Cañon Ybarra, *Stewart 1257* (GH); Sierra de las Cruces, *Stewart 1109* (GH); Cuatro Ciénegas, *Marsh 2049* (GH). **Nuevo León:** Sabinas Hidalgo, *Leavenworth 43* (F).

Morphologically this species is very closely related to *S. pallida*. The production of a hybrid with *S. purpurea* also points out a relationship. The indecisiveness of negative results from crossing as stated by Rollins (1953) for genera is valuable as well for the species relationship. The production of a hybrid indicates its relationship with *S. purpurea* while it does not negate a potential relationship to *S. pallida*. We may point out that there also exists a close relationship between *S. pallida* and *S. purpurea*. Both *S. ovata* and *S. purpurea* used as parents are tetraploids with  $2n = 24$  chromosomes, while *S. pallida* is a diploid. From the crosses involving this tetraploid, *S. purpurea*, and *S. pallida* it is also concluded (unpublished) that *S. pallida* has contributed one genome to the tetraploid *S. purpurea*. *S. purpurea* has also been reported in diploid condition (Bose, 1959). The relationships between these three morphologically closely related species cannot be fully understood without more experimental evidence especially involving diploid *S. purpurea*. Superficially *S. ovata* looks very much

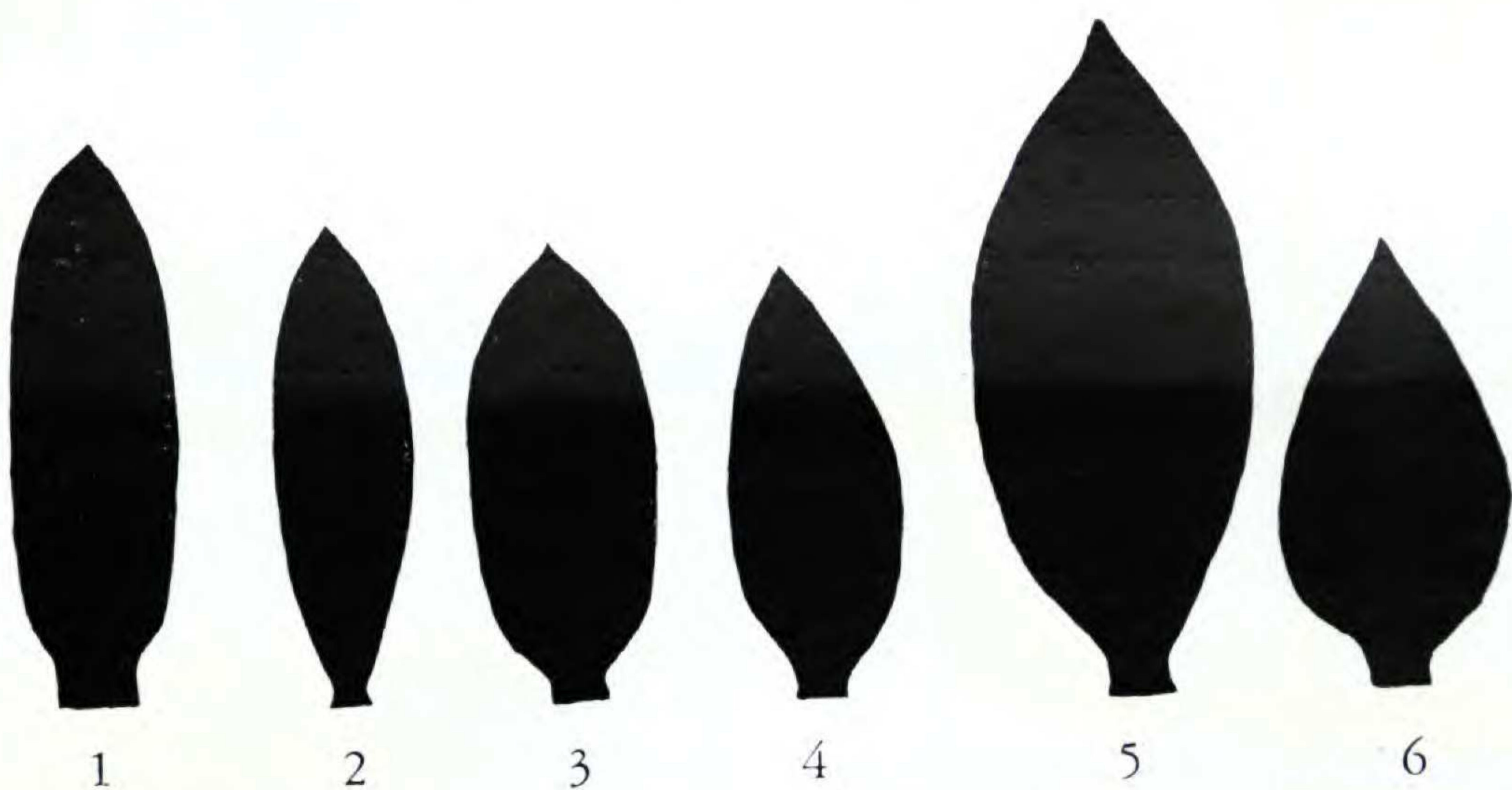


FIG. 1. Leaf shape in *S. pallida*; FIG. 2-4. Leaf shape variation in *S. ovata*; FIG. 5-6. *S. brevifolia*. Figures represent half of the actual leaf size.

like a segmental allotetraploid between two ecotypes of *S. pallida*.

*S. ovata* was once described as a variety of *S. leiandra* but morphological data do not provide any basis for a direct relationship between the two species. Our studies indicate that *S. leiandra* is a somewhat specialized species directly related to one of the more primitive species, *S. australis*. The line of evolution here is apparently different from that of *S. purpurea*, *S. pallida* and *S. brevifolia*. *S. ovata* and *S. brevifolia* were included as varieties of *S. leiandra* at the time when the genus *Setcreasea* did not exist. The early reference indicates a broad group relationship rather than a direct close one.

The most characteristic feature of *S. ovata* is the presence of a very strong underground rhizome. This provides a very efficient method of vegetative reproduction. The other experimentally known species of this genus also possess a vegetative mode of reproduction. These species, as pointed out earlier, are easily crossed, but they lack an underground rhizome. In the latter, only aerial branches in contact with soil for a period of time are able to produce roots. This method is by no means efficient enough to colonize an area.

Whether strong vegetative reproduction is a direct outcome of polyploidy or if it has evolved through selection cannot be answered without further experimentation and field study. Absence of a rhizome in herbarium specimens may not necessarily mean its absence in nature. It may be due to incomplete collection. It may only be said that a capacity for vegetative propagation is present in the near relatives, a condition preliminary to efficient vegetative reproduction, as pointed out by Darlington (1956).

Within *S. ovata* a range of variation in leaf shape is found from narrowly elliptic to ovate. Superficially it looks like a range of variation that would be expected of intermediates between *S. pallida* and *S. brevifolia* (fig. 1-6). From the available data it does not seem to be the result of introgression involving these two species. First of all, no tetraploid *S. pallida* has been reported, and *S. ovata* is not a triploid. On the basis of experimental evidence from crossing data

a free exchange of genes with *S. brevifolia* does not seem to be probable. One way this variation could be explained is through mutations as found in *Cyrilla* (Thomas, 1960).

## ACKNOWLEDGEMENTS

Thanks are extended to the curators of the Gray Herbarium of Harvard University, Cambridge; United States National Herbarium, Washington, D. C.; Missouri Botanical Garden, St. Louis; Chicago Natural History Museum, Chicago, and Herbarium of the University of Michigan, Ann Arbor for the loan of the herbarium specimens. The authors are also indebted to Mr. Robert M. Ahring, in charge of U.S.D.A. Seed Testing Laboratory, Stillwater, for the germination tests on hybrid seeds. A critical review by Professor Reed C. Rollins, Director, Gray Herbarium, Harvard University, Cambridge, Mass., and helpful suggestions of Professor Jack R. Harlan, Department of Agronomy, and Dr. J. M. J. de Wet Department of Botany, Oklahoma State University, Stillwater, Oklahoma are highly appreciated. — DEPARTMENT OF BOTANY AND PLANT PATHOLOGY, OKLAHOMA STATE UNIVERSITY, STILLWATER, OKLAHOMA.

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